SOUTH DAKOTA STATEWIDE FISHERIES SURVEY

2102-F-21-R-42

Name: Menno Dam **County**: Hutchinson
Legal Description: T98N-R57W-Sec. 32
Location from nearest town: 1 mi. west, 1½ miles north, ½ mi. west of Menno, SD

Dates of present survey: August 17-18, 2009 (netting); June 4, 2009 (electrofishing)
Dates of last survey: August 20-22, 2007 (netting); June 9, 2007 (electrofishing)
Most recent lake management plan: F-21-R-32 (January 1, 2000-December 31, 2004)
Management classification: Warmwater Permanent

Primary Game Species	Secondary and Other Species
Largemouth Bass	Black Bullhead
Black Crappie	Green Sunfish
Channel Catfish	Yellow Perch
Bluegill	White Sucker

PHYSICAL DATA

Surface Area: 47 acres **Watershed**: 14.4 square miles
Maximum depth: 34 feet **Mean depth**: 13 feet
Volume: No data **Shoreline length**: No data
Contour map available: No **Date mapped**: NA
OHWM elevation: None set **Date set**: NA
Outlet elevation: None set **Date set**: NA
Lake elevation observed during the survey: Full
Beneficial use classifications: (5) warmwater semipermanent fish propagation, (7) immersion recreation, (8) limited-contact recreation and (9) wildlife propagation and stock watering.

Introduction

The original Menno Lake was an artificial impoundment created by the construction of a dam across Furlong Creek by the Works Progress Administration (WPA) in 1936. The original dam was destroyed by flood waters in 1984. Reconstruction of the dam in a new location slightly downstream was completed in 1995 and fisheries management resumed in 1996.

Ownership of Lake and Adjacent Lakeshore Property

The State of South Dakota owns Menno Dam, and the fishery is managed by the Department of Game, Fish and Parks (GFP). GFP owns some land on the south side of the lake but the rest of the shoreline is privately owned. To allow recreational access, GFP has a 15-foot easement above the Ordinary High Water Mark around the privately owned shoreline.

Fishing Access

The Menno Dam Access Area contains a boat ramp with a dock and a public toilet. The Lake Menno Association manages a small campground on the lake that has camper hookups and a picnic shelter. A new, handicapped-accessible fishing pier is planned for the near future. Shore fishing opportunities are abundant. The entire lake has been designated as a no-wake zone. At no time can boats exceed 5 mph or produce a visible wake.

Field Observations of Water Quality and Aquatic Vegetation

Although the water in Menno Dam was stained brown during the survey, it was still fairly clear with a Secchi depth measurement of 1 m (39 in). Some scattered beds of sago pondweed (*Potamogeton* pectinatus) were observed in shallow areas and duckweed (*Lemna* spp) was seen on the surface in protected areas. The lake still contains a considerable amount of flooded brush and timber.

BIOLOGICAL DATA

Methods:

Menno Dam was sampled on August 17-18, 2009 with ten overnight trap net sets. The trap nets are constructed with 19-mm-bar-mesh (¾ in) netting, 0.9 m high x 1.5 m wide (3 ft high x 5 ft wide) frames and 18.3 m (60 ft) long leads. One hour of nighttime electrofishing was done on June 4, 2009 to sample the largemouth bass population. Sampling sites are displayed in Figure 4.

Results and Discussion:

Trap Net Catch

Bluegill comprised 67.8% of the trap-net catch (Table 1). Black bullhead, black crappie, yellow perch, hybrid sunfish, white sucker, largemouth bass, and channel catfish, were also sampled.

Table 1. Total catch from ten overnight trap net sets at Menno Dam, Hutchinson County, August 17-18, 2009.

Species	Number	Percent	CPUE	80% C.I.	Mean CPUE*	PSD	RSD-P	Mean Wr
Bluegill	431	67.8	43.1	±15.6	4.2	91	3	104
Black Bullhead	104	16.4	10.4	±4.4	520.4	98	49	100
Black Crappie	45	7.1	4.5	±1.2	26.6	56	0	111
Yellow Perch	26	4.1	2.6	±1.6	1.4	77	0	91
Hybrid Sunfish	13	2.0	1.3	±0.9	0.0	--	--	--
White Sucker	13	2.0	1.3	±1.3	1.4	100	100	95
Largemouth Bass	3	0.5	0.3	±0.4	12.9	--	--	--
Channel Catfish	1	0.2	0.1	±0.1	2.1	--	--	--

* 7 years (1997-1999, 2001, 2003, 2005, 2007)

Table 2. Catch per unit effort by length category for various fish species captured with trap nets in Menno Dam, August 17-18, 2009.

Species	Substock	Stock	S-Q	Q-P	P+	All sizes	80% C.I.
Bluegill	--	43.1	4.1	37.8	1.2	43.1	±15.6
Black Bullhead	--	10.4	0.2	5.1	5.1	10.4	±4.4
Black Crappie	0.2	4.3	1.9	2.4	--	4.5	±1.2
Yellow Perch	--	2.6	0.6	2.0	--	2.6	±1.6
Hybrid Sunfish*	--	--	--	--	--	1.3	±0.9
White Sucker	--	1.3	--	--	1.3	1.3	±1.3
Largemouth Bass	0.1	0.2	0.1	--	0.1	0.3	±0.4
Channel Catfish	--	0.1	--	0.1	--	0.1	±0.1

*No length categories established. Length categories can be found in Appendix A.

Electrofishing Catch

Fifty-one largemouth bass were sampled during one hour of nighttime electrofishing on June 4, 2009.

Table 3. Largemouth bass sampled during one hour of nighttime electrofishing on Menno Dam, Hutchinson County, June 4, 2009.

Species	Number	Catch/Hour	Mean CPUE*	PSD	RSD-P	Mean Wr
Largemouth Bass	51	51.0	48.5	52	27	107

* 5 years (1998, 2001, 2003, 2005, 2007)

Largemouth Bass

Management objective: Maintain a largemouth bass fishery with an electrofishing CPH of at least 20 and RSD-P between 20 and 40.

While largemouth bass electrofishing CPUE decreased in 2009 (Tables 3 and 4) it is still well above the management objective. Natural reproduction seems to be maintaining the population. No bass has been stocked since 2006 and two thirds of the fish sampled this year were younger than that.

All sampled bass over 200 mm (8 in) were PIT tagged in order to validate ages assigned using scales and todetermine longevity. Growth has improved and is just below regional means (Table 5). About 82% of the bass sampled in 2009 would be protected from harvest under the 38.1 cm (15 inch) minimum length limit.

Table 4. Largemouth bass electrofishing CPUE, PSD, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 2001-2009.

	2001	2002	2003	2004	2005	2006	2007	2008	2009	Mean*
CPUE	110.0		43.5		18.0		71.0		51.0	48.5
PSD	63		23		100		41		52	57
RSD-P	43		10		75		7		27	34
Mean Wr	92		98		102		97		107	97

*5 years (1998, 2001, 2003, 2005, 2007)

Table 5. Average back-calculated lengths (mm) for each age class of largemouth bass in Menno Dam, Hutchinson County, 2009.

			Back-calculation Age							
Year Class	Age	N	1	2	3	4	5	6	7	8
2008	1	9	99							
2007	2	10	82	173						
2006	3	15	94	159	231					
2005	4	2	101	218	305	346				
2004	5	8	114	210	275	330	358			
2003	6	3	114	209	278	346	375	388		
2001	8	1	157	255	313	347	395	424	450	468
All Classes		**48**	**109**	**204**	**280**	**342**	**376**	**406**	**450**	**468**
Statewide Mean			96	182	250	305	342			
Region III Mean			111	212	287	347	383			
SLI* Mean			99	183	246	299	332			

*Small Lakes and Impoundments (<150 acres)

Black Crappie

Management objective: Maintain a black crappie fishery with a trap net CPUE of at least 20 and PSD of at least 40.

Black crappie trap net CPUE and PSD has decreased since 2007 (Table 6). Most of the crappies sampled were from the 2007 year class and did not show up in the last survey. Black crappie condition is good and growth has improved and now falls between statewide and regional means (Table 7). Improved growth may be in response to a decrease in both the abundance of black bullheads (Table 8) and black crappies (Table 6).

The length frequency histograms in Figure 2 show an average length of 192 mm (7.6 in) and a narrow length range (12-22 cm, 4.7-8.7 in) for the population ranging in age from 1 to 3.

Table 6. Black crappie trap-net CPUE, PSD, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 1999-2009.

	1999	2000	2001	2002	2003	2004	2005	2007	2008	2009	Mean*
CPUE	55.3		30.1		51.9		2.8	32.4		4.5	26.6
PSD	1		0		39		43	75		56	38
RSD-P	1		0		0		0	1		0	2
Mean Wr	116		117		94		100	102		111	109

*7 years (1997-1999, 2001, 2003, 2005, 2007)

Table 7. Average back-calculated lengths (mm) for each age class of black crappie in Menno Dam, Hutchinson County, 2009.

			Back-calculation Age							
Year Class	Age	N	1	2	3	4	5	6	7	8
2008	1	6	66							
2007	2	38	76	153						
2006	3	1	73	172	203					
All Classes		**45**	**72**	**163**	**203**					
Statewide Mean			83	147	195	229	249			
Region III Mean			95	167	219	253	274			
SLI* Mean			78	134	180	209	226			

*Small Lakes and Impoundments (<150 acres)

Bluegill

Management objective: Maintain a bluegill fishery with a trap-net CPUE of at least 20 and RSD-18 of at least 20.

Bluegill abundance and size structure surpass the management objective (Table 8 and Figure 3). Anglers are reporting success in open water and ice fishing. Growth is above the statewide and small lakes and impoundments means, and near the regional average (Table 9). Condition is good with a relative weight of 104 (Table 8).

Table 8. Bluegill trap-net CPUE, PSD, RSD-18, RSD-P, and mean Wr for Menno Dam, Hutchinson County, 1999-2009.

	1999	2000	2001	2002	2003	2004	2005	2007	2008	2009	Mean*
CPUE	1.2		2.1		2.2		0.8	23.3		43.1	5.9
PSD	83		100		100		--	24		91	77
RSD-18	0		79		27		--	3		40	27
RSD-P	0		0		9		--	2		3	3
Mean Wr	98		98		109		--	91		104	99

*5 years (1999, 2001, 2003, 2005, 2007)

Table 9. Average back-calculated lengths (mm) for each age class of black crappie in Menno Dam, Hutchinson County, 2009.

			Back-calculation Age							
Year Class	Age	N	1	2	3	4	5	6	7	8
2008	1	37	52							
2007	2	45	59	115						
2006	3	187	50	104	151					
2005	4	154	52	104	148	172				
2003	6	8	47	91	149	174	202	214		
All Classes		**431**	**52**	**104**	**149**	**173**	**202**	**214**		
Statewide Mean			55	103	141	166				
Region III Mean			60	116	157	180				
SLI* Mean			53	101	138	163				

*Small Lakes and Impoundments (<150 acres)

Black Bullhead

Management objective: Maintain a black bullhead population with a trap net CPUE of no more than 100.

Black bullhead trap net CPUE has declined substantially since 1999 (Table 10) resulting in an increase in PSD and an improved population size structure (Figure 4). The mean length of bullheads sampled this year was 295 mm (11.6 in). Increased largemouth bass abundance and poor bullhead recruitment are likely responsible for the population decline.

Table 10. Black bullhead trap-net CPUE and PSD for Menno Dam, Hutchinson County, 1999-2009.

	1999	2001	2002	2003	2004	2005	2007	2008	2009	Mean*
CPUE	2276.4	873.3		168.1		29.8	7.8		10.4	520.4
PSD	50	0		1		92	86		98	44
RSD-P	--	0		0		0	4		49	1
Mean Wr	--	--		83		86	86		100	85

*7 years (1997-1999, 2001, 2003, 2005, 2007)

All Species

Bluegill, black crappie and largemouth bass abundance is relatively high and rough fish abundance is not a problem. Overall, the Menno fishery is still in pretty good shape.

Table 11. Electrofishing (EF) and trap-net (TN) CPUE for all fish species sampled in Menno Dam, Hutchinson County, 1999-2009.

Species	1999	2000	2001	2002	2003	2004	2005	2007	2008	2009
WHS (TN)	3.7		0.1		3.6		1.2	0.4		1.3
BLB (TN)	2276.4		873.3		168.1		29.8	7.8		10.4
CCF (TN)	10.6		1.3		0.8		0.1	0.1		0.1
NOP (TN)	0.1		--		--		--	--		--
GSF (TN)	16.7		0.3		0.2		2.6	0.5		--
HYB (TN)	--		--		--		--	0.1		1.3
BLG (TN)	1.2		2.1		2.2		0.8	23.3		43.1
LMB (EF)	--		110.0		43.5		18.0	71.0		51.0
LMB (TN)	0.6		--		0.1		--	--		0.3
BLC (TN)	55.3		30.1		51.9		2.8	32.4		4.5
YEP (TN)	3.2		1.4		0.5		--	--		2.6

WHS (White Sucker), BLB (Black Bullhead), CCF (Channel Catfish), NOP (Northern Pike), GSF (Green Sunfish), HYB (Hybrid Sunfish), BLG (Bluegill), LMB (Largemouth Bass), BLC (Black Crappie), YEP (Yellow Perch),

MANAGEMENT RECOMMENDATIONS

1. Continue to monitor the lake by conducting biennial netting and electrofishing surveys.

Table 12. Stocking record for Menno Dam, Hutchinson County, 1996-2009.

Year	Number	Species	Size
1996	360	Black Crappie	Fingerling
	250	Black Crappie	Adult
	4,700	Channel Catfish	Fingerling
	4,770	Largemouth Bass	Fingerling
	5,000	Rainbow Trout	Fingerling
1997	1,120	Black Crappie	Adult
	4,700	Channel Catfish	Fingerling
	210	Largemouth Bass	Fingerling
1998	313	Black Crappie	Adult
	4,700	Largemouth Bass	Fingerling
1999	2,200	Black Crappie	Juvenile
	393	Largemouth Bass	Adult
	4,700	Largemouth Bass	Fingerling
2000	2,500	Largemouth Bass	Fingerling
	71	Largemouth Bass	Adult
2004	170	Channel Catfish	Adult
2005	100	Channel Catfish	Adult
2006	95	Largemouth Bass	Adult
	50	Channel Catfish	Adult

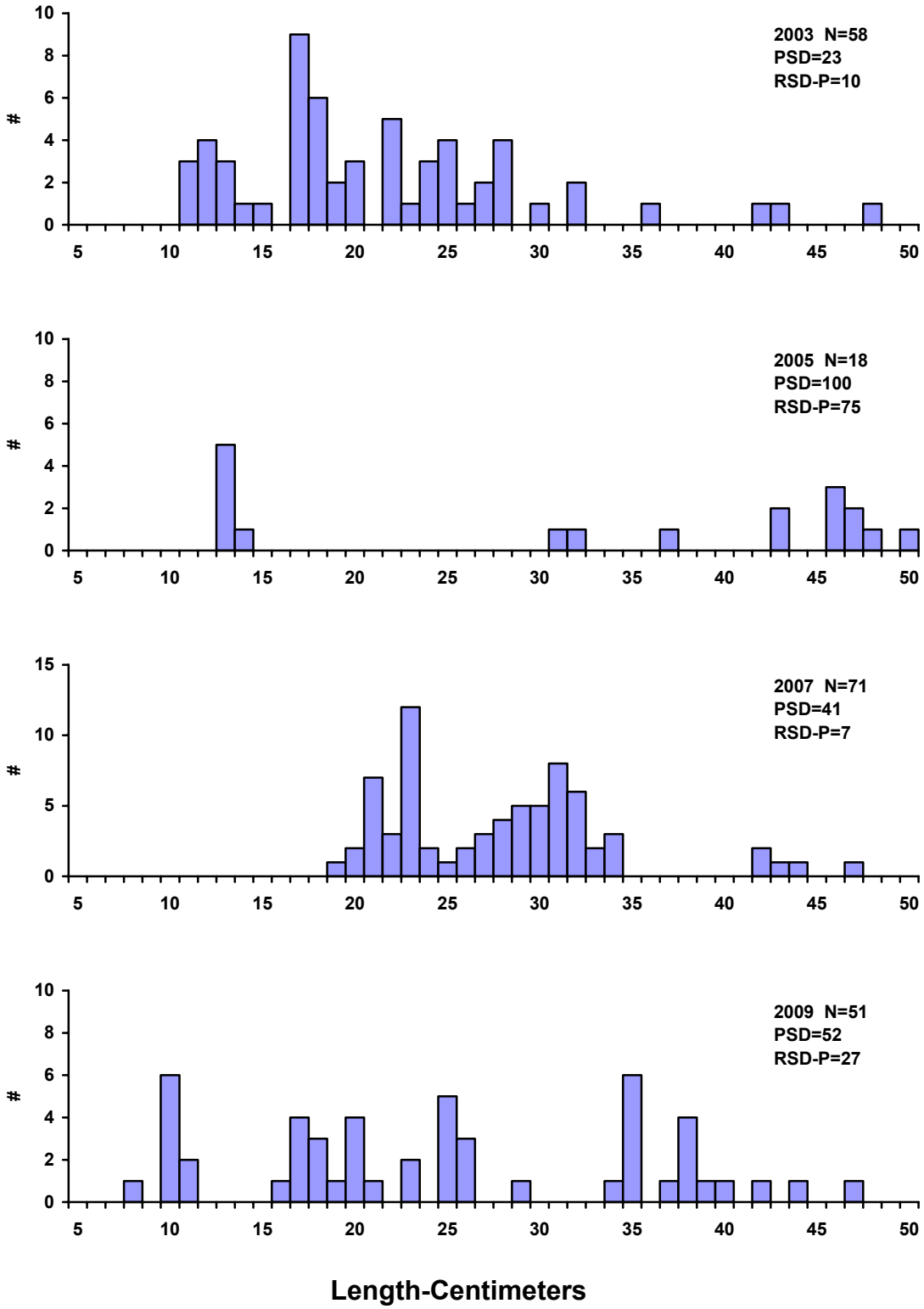

Figure 1. Length frequency histogram for largemouth bass sampled by electrofishing in Menno Dam, Hutchinson County, 2003, 2005, 2007, and 2009.

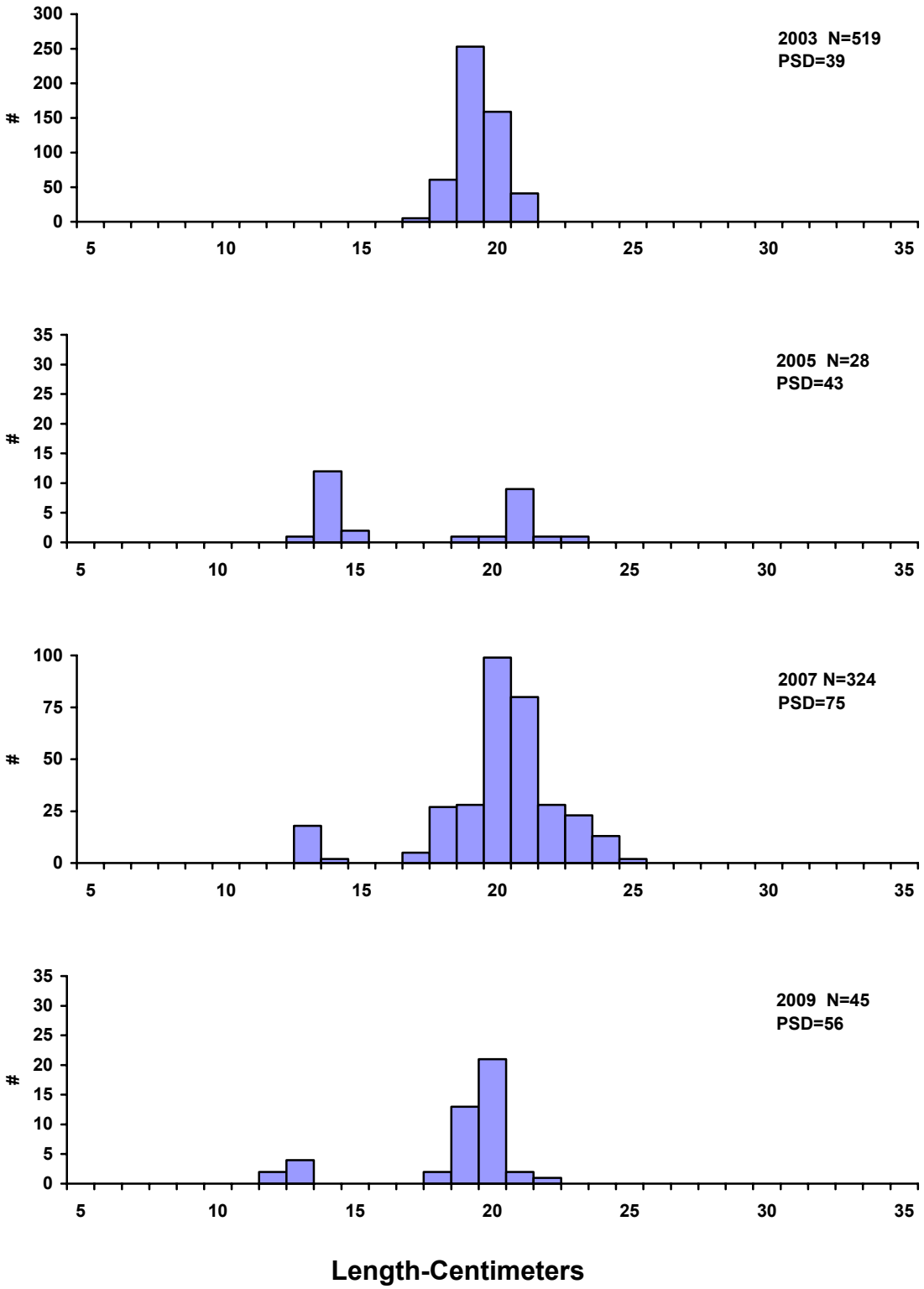

Figure 2. Length frequency histograms for black crappies sampled with trap nets in Menno Dam, Hutchinson County, 2003, 2005, 2007, and 2009.

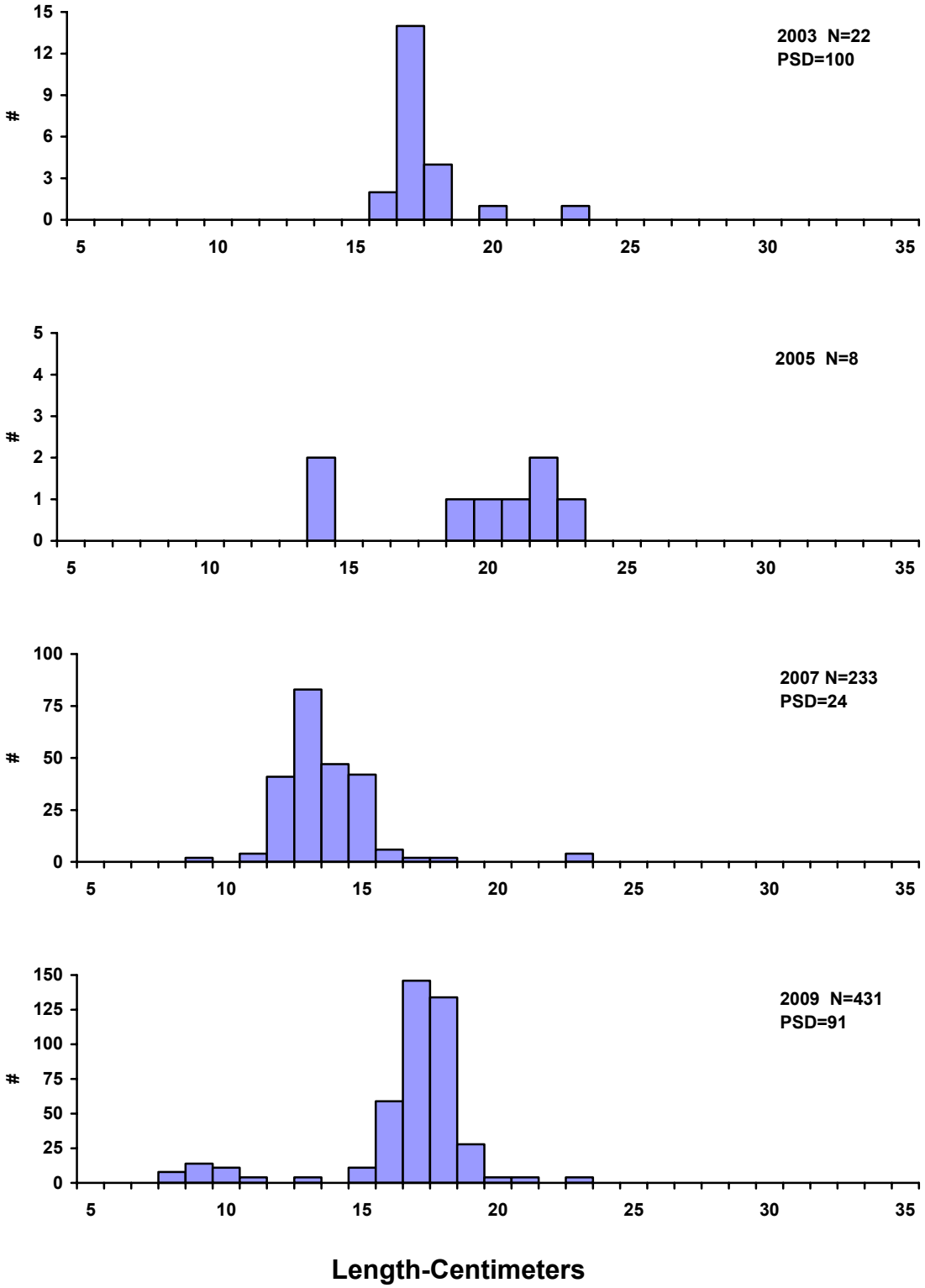

Figure 3. Length frequency histograms for bluegills sampled with trap nets in Menno Dam, Hutchinson County, 2003, 2005, 2007, and 2009.

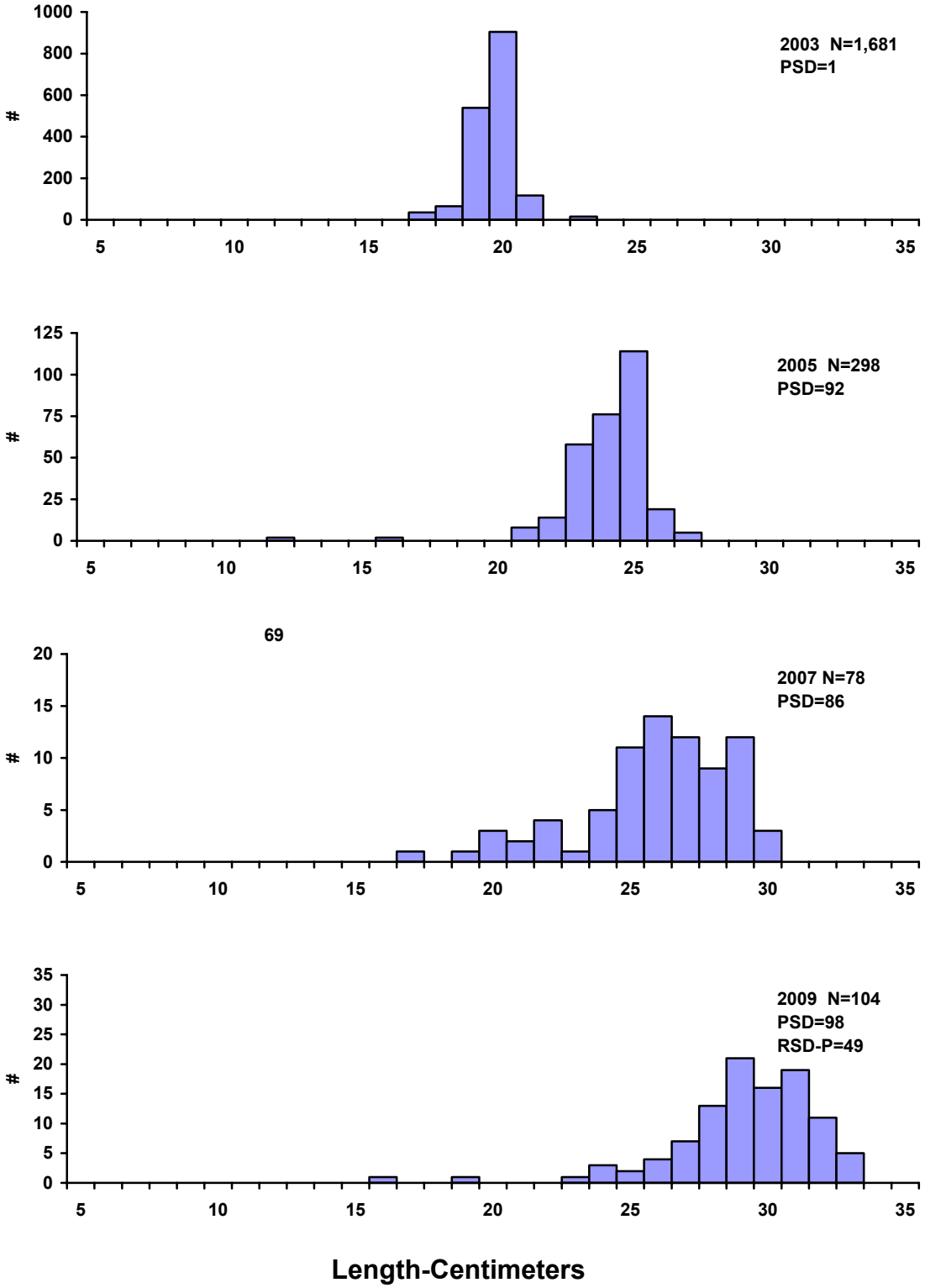

Figure 4. Length frequency histograms for black bullheads sampled with trap nets in Menno Dam, Hutchinson County, 2003, 2005, 2007, and 2009.

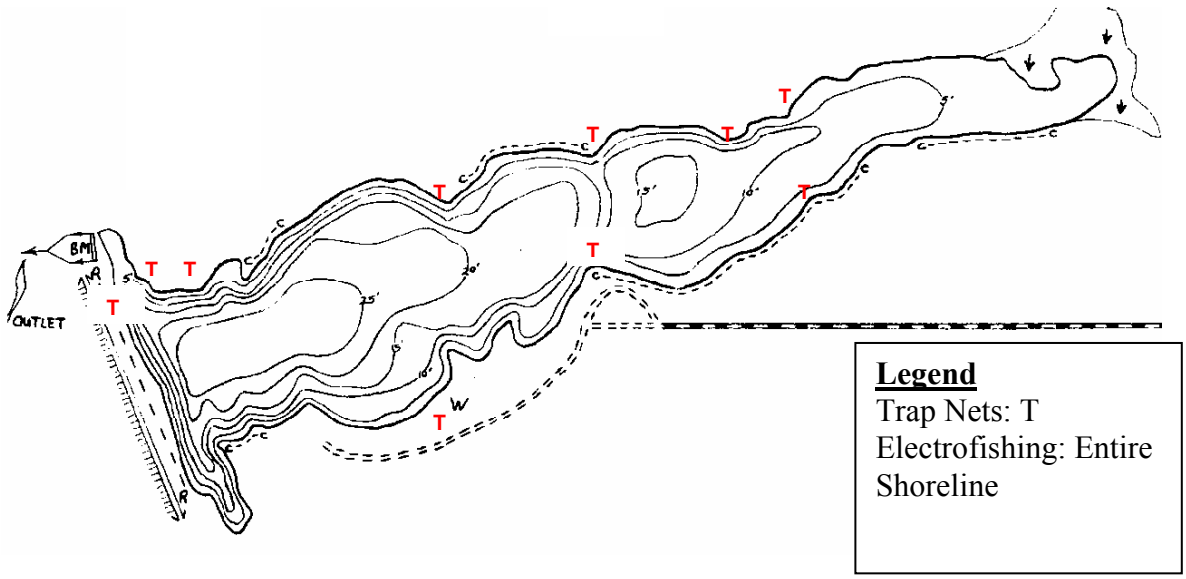

Figure 4. Sampling locations on Menno Dam, Hutchinson County, 2009.

Appendix A. A brief explanation of catch per unit effort (CPUE), proportional stock density (PSD), relative stock density (RSD) and relative weight (Wr).

Catch Per Unit Effort (CPUE) is the catch of animals in numbers or in weight taken by a defined period of effort. Can refer to trap-net nights of effort, gill-net nights of effort, catch per hour of electrofishing, etc.

Proportional Stock Density (PSD) is calculated by the following formula:

$$PSD = \frac{\text{Number of fish} > \text{quality length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

Relative Stock Density (RSD-P) is calculated by the following formula:

$$RSD\text{-}P = \frac{\text{Number of fish} > \text{preferred length}}{\text{Number of fish} \geq \text{stock length}} \times 100$$

PSD and RSD-P are unitless and usually calculated to the nearest whole digit.

Size categories for selected species found in Region 3 lake surveys, in centimeters.

Species	Stock	Quality	Preferred	Memorable	Trophy
Walleye	25	38	51	63	76
Sauger	20	30	38	51	63
Yellow perch	13	20	25	30	38
Black crappie	13	20	25	30	38
White crappie	13	20	25	30	38
Bluegill	8	15	20	25	30
Largemouth bass	20	30	38	51	63
Smallmouth bass	18	28	35	43	51
Northern pike	35	53	71	86	112
Channel catfish	28	41	61	71	91
Black bullhead	15	23	30	38	46
Common carp	28	41	53	66	84
Bigmouth buffalo	28	41	53	66	84
Smallmouth buffalo	28	41	53	66	84

For most fish, 30-60 or 40-70 are typical objective ranges for “balanced” populations. Values less than the objective range indicate a population dominated by small fish while values greater than the objective range indicate a population comprised mainly of large fish.

Relative weight (Wr) is a condition index that quantifies fish condition (i.e., how much does a fish weigh for its length). A Wr range of 90-100 is a typical objective for most fish species. When mean Wr values are well below 100 for a size group, problems may exist in food and feeding relationships. When mean Wr values are well above 100 for a size group, fish may not be making the best use of available prey.